

REMARKS

The Office Action dated January 7, 2009 has been received and carefully noted. The above amendments and following remarks are being submitted as a full and complete response thereto.

Claims 1, 4-6 and 15-16 are pending. By this Amendment, Claims 2-3, 7-14 and 17-19 are cancelled without prejudice or disclaimer and Claims 1, 4-6 and 15-16 are amended. A Substitute Specification has been submitted and Replacement Sheets of formal drawing Figures 1-14 are submitted. Support for the amendments to the claims may be found in the application as originally filed. Applicants respectfully submit that no new subject matter is presented herein. Reconsideration of this application is respectfully requested in view of the following remarks.

Entry of Response Proper

Entry of this Amendment is proper under 37 C.F.R. §1.116 since the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not raise any new issues requiring further search and/or consideration on the part of the Examiner as the Amendment incorporates the subject matter of Claims 2-3 into Claim 1 and addresses the objections and rejections of form raised by the Office Action; (c) satisfy a requirement of form asserted in the previous Office Action; (d) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (e) place the application in better form for appeal, should an appeal be necessary. The Amendment is necessary and was not earlier presented because it is made in response to objections raised in the Final Rejection. Entry of the Amendment is thus respectfully requested.

Drawings

The drawings are objected to as failing to comply with 37 C.F.R. 1.84(p)(4) due to various inconsistencies. Enclosed herein are Replacement Sheets of formal drawing Figures 1-14, which have corrected the drawings in a manner believed to fully address the basis of the objection. Figures 15-46 have been cancelled and Figures 1-14 amended in accordance with submission of a Substitute Specification in order to remove the non-elected subject matter of the Election/Restriction requirement of June 26, 2008. Applicants respectfully request withdrawal of the objection to the drawings.

Specification

The Examiner suggested that the Specification should be amended to address various inconsistencies. Enclosed herein is a Substitute Specification which is believed to be in compliance with 37 CFR 1.52(a) and (b). A marked-up copy of the originally filed Specification indicating the changes made thereto by the Substitute Specification is also enclosed for the convenience of the Examiner. Applicant respectfully submits that no new matter is presented in any of the changes; moreover, any changes incorporated therein would readily be recognized and understood by one of ordinary skill in the art.

Claim Objections

Claims 1, 6, 15 and 16 are objected to for containing informalities therein. Applicants have amended the claims in a manner believed to be responsive to the objection. Applicants respectfully request withdrawal of the objection.

Claim Rejection Under 35 U.S.C. § 112

Claims 1-6, 15 and 16 are rejected under 35 U.S.C. § 112, second paragraph. Applicants have amended the claims in a manner believed to be responsive to the

rejection. Applicants respectfully request withdrawal of the rejection.

Claim Rejections Under 35 U.S.C. § 103

Claims 1, 2, 5, 6, and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Number 6,142,033 to Beigang in view of JP 2001-287122 to Shigeru and Claims 1, 2, 5, 6 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Number 5,779,551 to Stall *et al.* in view of JP2001-343023 to Shigeru. Applicants respectfully traverse the rejections for at least the following reason(s).

Claim 1 recites a mechanism for transmitting torque between a shaft and a hub that includes, among other features, a shaft tooth section formed on the shaft and a hub tooth section formed on the hub, wherein the shaft tooth section has a crowned peak having a varying tooth thickness along an axial length of the crowned peak and a shaft tooth valley and the hub tooth section has a peak opposing and engaging said shaft tooth valley of said shaft tooth section, said peak of said hub tooth section having a constant tooth thickness along an axial length and a hub tooth valley having a constant inside diameter in an axial direction of the shaft, and wherein the shaft tooth valley includes first and second portions having different outside diameters and connected by a first step region sloping from a first starting point at an end of the first portion to an end of the second portion in a direction extending toward the hub tooth section, the peak of said hub tooth section includes first and second peak portions having different inside diameters and connected by a second step region sloping from a second starting point at an end of the first peak portion to an end of the second peak portion in a direction extending away from said shaft tooth section, and the first starting point of the

first step region and the second starting point of the second step region are offset from each other in the axial direction of the shaft by a predetermined distance.

Beigang discloses a shaft/hub unit having a shaft 1 with shaft toothing 5 and a hub 2 with hub toothing 7, which sets of toothing engage one another. The tooth profile in Fig. 1 clearly illustrates that Beigang does not teach or suggest that the first starting point of the first step region of the shaft tooth section and the second starting point of the second step region of the hub tooth section are offset from each other in the axial direction of the shaft by a predetermined distance, as recited by Claim 1.

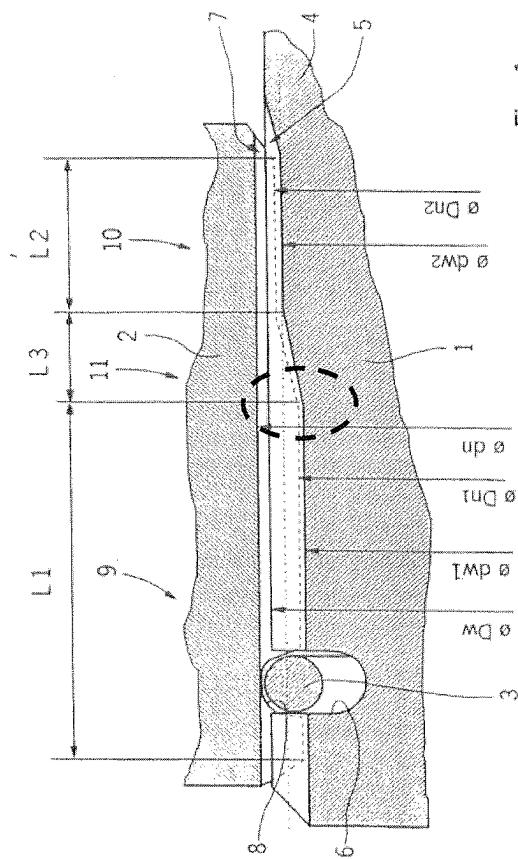
U.S. Patent

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6,142,033

Fig. 1



As highlighted above in Fig. 1 of Beigang, the first starting point of the first step region of the shaft tooth section and the second starting point of the second step region of the hub tooth section are aligned along the axial direction of the shaft 1 and clearly are not offset from each other. When the starting points of the step regions (slopes) are aligned with each other as disclosed in Beigang, a stress concentrates in the shaft. In contrast, in the present invention, the starting points are offset and the stresses are distributed for increased static mechanical strength and fatigue strength. See the comparison data presented in Fig. 9 and the associated discussion describing the effects found on page 21, line 13, to page 22, line 6, of the Substitute Specification. As such, Beigang does not obtain the effects of the present invention. Thus, Applicants respectfully submit that it would not be obvious for one of ordinary skill in the art to modify Beigang in order to arrive at the features of the present invention.

Moreover, Applicants respectfully submit that Stall and the publications of Shigeru, alone or by any combination, fail to teach or suggest the deficiencies of Beigang. Stall discloses a rotational fixed connection with a shaft 1 whose axial end is provided with outer shaft teeth 2 and a hub 3 whose through-bore is provided with inner teeth 4 (see Abstract). Fig. 1 illustrates clearly that, for example, Stall does not teach or suggest wherein the shaft tooth valley includes first and second portions having different outside diameters and connected by a first step region sloping from a first starting point at an end of the first portion to an end of the second portion in a direction extending toward the hub tooth section, the peak of said hub tooth section includes first and second peak portions having different inside diameters and connected by a second step region sloping from a second starting point at an end of the first peak portion to an

end of the second peak portion in a direction extending away from said shaft tooth section, and the first starting point of the first step region and the second starting point of the second step region are offset from each other in the axial direction of the shaft by a predetermined distance, as recited by Claim 1. The Shigeru publications are cited for teaching a crowned peak having varying tooth thickness along an axial length and do not cure the deficiencies of Beigang and Stall.

For at least the reason(s) provided above, Applicants respectfully submit that Beigang, Stall, and the cited publications of Shigeru, alone or by any combination, do not disclose, teach or suggest the present invention as recited by Claim 1. As such, Applicants respectfully submit that one of ordinary skill in the art would not find it obvious to modify Beigang according to the teachings of Stall and Shigeru, alone or in combination, because to do so would not arrive at the invention recited by Claim 1. Accordingly, Applicants submit that Claim 1 should be deemed allowable over Beigang, Stall and the cited publications of Shigeru.

Claims 4-6 and 15-16 depend from Claim 1. Applicants respectfully submit that these dependent claims be deemed allowable over Beigang, Stall and the cited publications of Shigeru, for at least the same reason(s) that Claim 1 is allowable, as well as for the additional subject matter recited therein.

Applicants respectfully request withdrawal of the rejections.

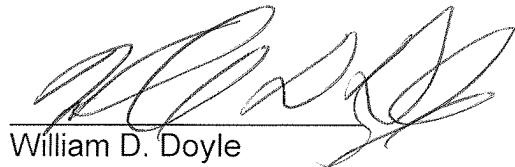
Conclusion

In view of the above, reconsideration of the application, withdrawal of the outstanding objections and rejections, allowance of Claims 1, 4-6 and 15-16, and the prompt issuance of a Notice of Allowance is respectfully requested.

Should the Examiner believe anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact the undersigned at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing Attorney Docket Number 025416.00026.**

Respectfully submitted,



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Enclosures: Replacement Sheets of Formal Drawings Figures 1-14
Substitute Specification (Marked Up Copy)
Substitute Specification (Clean Copy)

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